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7.3.1 Create PDP Context Request

A Create PDP Context Request shall be sent from a SGSN node to a GGSN node as a part of the GPRS PDP Context Activation procedure. The GGSN IP address where the SGSN sends the Create PDP Context Request is the first IP address in the list of IP addresses provided by the DNS server. After sending the Create PDP Context Request message, the SGSN marks the PDP context as 'waiting for response'. In this state the SGSN shall accept G-PDUs from the GGSN but shall not send these G-PDUs to the MS. A valid request initiates the creation of a tunnel between a PDP Context in a SGSN and a PDP Context in a GGSN. If the procedure is not successfully completed, the SGSN repeats the Create PDP Context Request message to the next GGSN address in the list of IP addresses, if there is one. If the list is exhausted the activation procedure fails.

The Tunnel Endpoint Identifier Data I field specifies a downlink Tunnel Endpoint Identifier for G-PDUs which is chosen by the SGSN. The GGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent downlink G-PDUs which are related to the requested PDP context.

The Tunnel Endpoint Identifier Signalling field specifies a downlink Tunnel Endpoint Identifier for signalling messages which is chosen by the SGSN. The GGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent downlink signalling messages which are related to the requested PDP context. [This field shall not be present if there already exists a signalling tunnel for the given MS between the peer GSNs.](#)

The MSISDN of the MS is passed to the GGSN inside the Create PDP Context Request; This additional information can be used when a secure access to a remote application residing on a server is needed. The GGSN would be in fact able to provide the user identity (i. e. the MSISDN) to the remote application server, providing it with the level of trust granted to users through successfully performing the GPRS authentication procedures, without having to re-authenticate the user at the application level.

If the MS requests a dynamic PDP address and a dynamic PDP address is allowed, then the PDP Address field in the End User Address information element shall be empty. If the MS requests a static PDP Address then the PDP Address field in the End User Address information element shall contain the static PDP Address. In case the PDP addresses carried in the End User Address and optionally in the Protocol Configuration Option information element contain contradicting information, the PDP address carried in the End User Address information element takes the higher precedence. The Quality of Service Profile information element shall be the QoS values to be negotiated between the MS and the SGSN at PDP Context activation.

The SGSN shall include an SGSN Address for signalling and an SGSN address for user traffic, which may differ from that provided by the underlying network service (e.g. IP). The GGSN shall store these SGSN Addresses and use them when sending signalling on this GTP tunnel or G-PDUs to the SGSN for the MS.

The SGSN shall include a Recovery information element into the Create PDP Context Request if the SGSN is in contact with the GGSN for the very first time or if the SGSN has restarted recently and the new Restart Counter value has not yet been indicated to the GGSN. The GGSN that receives a Recovery information element in the Create PDP Context Request message element shall handle it in the same way as when receiving an Echo Response message. The Create PDP Context Request message shall be considered as a valid activation request for the PDP context included in the message.

The SGSN shall include either the MS provided APN, a subscribed APN or an SGSN selected APN in the message; the Access Point Name may be used by the GGSN to differentiate accesses to different external networks. The Selection Mode information element shall indicate the origin of the APN in the message.

For secondary PDP contexts the SGSN shall include the NSAPI of the primary PDP context to associate the secondary PDP context with and a TFT to be used for packet filtering by GGSN. When creating a secondary PDP context, the Selection mode, MSISDN, End User Address, Access Point Name and Protocol Configuration Options information elements shall not be included in the message.

The optional Protocol Configuration Options information element is applicable for the end user protocol 'IP' only.

The SGSN shall select one GGSN based on the user provided or SGSN selected APN. The GGSN may have a logical name that is converted to an address. The conversion may be performed with any name-to-address function. The converted address shall be stored in the "GGSN Address in Use" field in the PDP context and be used during the entire lifetime of the PDP context.

NOTE: A DNS query may be used as the name-to-IP address mapping of the GGSN. The IP address returned in the DNS response is then stored in the "GGSN Address in Use" field in the PDP context.

The IMSI information element together with the NSAPI information element uniquely identifies the PDP context to be created.

The SGSN may send a Create PDP Context Request even if the PDP context is already active.

The GGSN shall check if the PDP context already exists for the MS. The existing parameters in the PDP context shall then be replaced with the parameters in the Create PDP Context Request message. If a dynamic PDP address has already been allocated for the existing context, this address should be used and copied to the Create PDP Context Response message.

If the GGSN uses the MNRG flag and the flag is set, the GGSN should treat the Create PDP Context Request as a Note MS Present Request and clear the MNRG flag.

The optional Private Extension contains vendor or operator specific information.

Table 4: Information elements in a Create PDP Context Request

Information element	Presence requirement	Reference
IMSI	Conditional	7.7.2
Recovery	Optional	7.7.11
Selection mode	Mandatory	7.7.12
Tunnel Endpoint Identifier Data I	Mandatory	7.7.13
Tunnel Endpoint Identifier Signalling	MandatoryConditional	7.7.14
End User Address	Conditional	7.7.17
Access Point Name	Conditional	7.7.20
Protocol Configuration Options	Conditional	7.7.21
SGSN Address for signalling	Mandatory	GSN Address 7.7.22
SGSN Address for user traffic	Mandatory	GSN Address 7.7.22
MSISDN	Conditional	7.7.23
Quality of Service Profile	Mandatory	7.7.25
Private Extension	Optional	7.7.26
TFT	Conditional	7.7.28
NSAPI	Mandatory	7.7.30
Primary NSAPI	Conditional	7.7.30

*** Next Change ***

7.3.2 Create PDP Context Response

The message shall be sent from a GGSN node to a SGSN node as a response of a Create PDP Context Request. When the SGSN receives a Create PDP Context Response with the Cause value indicating 'Request Accepted', the SGSN activates the PDP context and may start to forward T-PDUs to/from the MS from/to the external data network.

The Cause value indicates if a PDP context has been created in the GGSN or not. A PDP context has not been created in the GGSN if the Cause differs from 'Request accepted'. Possible Cause values are:

- 'Request Accepted'
- 'No resources available'

- 'All dynamic PDP addresses are occupied'
- 'No memory is available'
- 'Service not supported'
- 'User authentication failed'
- 'System failure'
- 'Mandatory IE incorrect'
- 'Mandatory IE missing'
- 'Optional IE incorrect'
- 'Invalid message format'
- 'Version not supported'

'No resources available' indicates e.g. that all dynamic PDP addresses are occupied or no memory is available. 'Service not supported' indicates e.g. when the GGSN does not support the PDP type, PDP address or Access Point Name. 'User authentication failed' indicates that the external packet network has rejected the service requested by the user.

Only the Cause information element, optionally Protocol Configuration Options and optionally the Recovery information element shall be included in the response if the Cause contains another value than 'Request accepted'.

All information elements, except Recovery, Protocol Configuration Options, and Private Extension, are mandatory if the Cause contains the value 'Request accepted'.

The Tunnel Endpoint Identifier Data I field specifies an uplink Tunnel Endpoint Identifier for G-PDUs which is chosen by the GGSN. The SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent uplink G-PDUs which are related to the requested PDP context.

The Tunnel Endpoint Identifier Signalling field specifies an uplink Tunnel Endpoint Identifier for signalling messages which is chosen by the GGSN. The SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent uplink signalling messages which are related to the requested PDP context. This field shall not be present if there already exists a signalling tunnel for the given MS between the peer GSNs.

The GGSN shall include a GGSN Address for signalling and a GGSN address for user traffic, which may differ from that provided by the underlying network service (e.g. IP). The SGSN shall store these GGSN Addresses and use them when sending signalling on this GTP tunnel or G-PDUs to the GGSN for the MS.

If the MS requests a dynamic PDP address and a dynamic PDP address is allowed, then the End User Address information element shall be included and the PDP Address field in the End User Address information element shall contain the dynamic PDP Address allocated by the GGSN. In case the PDP addresses carried in the End User Address and optionally in the Protocol Configuration Option information element contain contradicting information, the PDP address carried in the End User Address information element takes the higher precedence.

The QoS values supplied in the Create PDP Context Request may be negotiated downwards by the GGSN. The negotiated values or the original values from SGSN are inserted in the Quality of Service Profile information element of the Create PDP Context Response message.

If a connection-less path is to be used to tunnel T-PDUs for the given PDP context or a reliable connection-oriented path is to be used and a connection already exists, the GGSN may start to forward T-PDUs after the Create PDP Context Response has been sent and the SGSN may start to forward T-PDUs when the Create PDP Context Response has been received. In this case the SGSN shall also be prepared to receive T-PDUs from the GGSN after it has sent a Create PDP Context Request but before a Create PDP Context Response has been received.

If a reliable connection-oriented path is to be used to tunnel T-PDUs for the given PDP context and a connection does not exist between the GSN pair, the SGSN shall establish a connection and the GGSN shall wait for the connection before forwarding of T-PDUs may start.

Only one connection shall be used between any given GSN-pair, and this connection shall be used to tunnel end user traffic in both directions.

The Reordering Required value supplied in the Create PDP Context Response indicates whether the end user protocol benefits from packet in sequence delivery and whether the SGSN and the GGSN therefore shall perform reordering or not, i.e. if reordering is required by the GGSN the SGSN and the GGSN shall perform reordering of incoming T-PDUs on this path.

The GGSN shall include the Recovery information element into the Create PDP Context Response if the GGSN is in contact with the SGSN for the first time or the GGSN has restarted recently and the new Restart Counter value has not yet been indicated to the SGSN. The SGSN receiving the Recovery information element shall handle it as when an Echo Response message is received but shall consider the PDP context being created as active if the response indicates a successful context activation at the GGSN.

The Charging ID is used to identify all charging records produced in SGSN(s) and the GGSN for this PDP context. The Charging ID is generated by the GGSN and shall be unique within the GGSN.

The Charging Gateway Address is the IP address of the recommended Charging Gateway Functionality to which the SGSN should transfer the Charging Detail Records (CDR) for this PDP Context.

The optional Private Extension contains vendor or operator specific information.

Table 5: Information elements in a Create PDP Context Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
Reordering required	Conditional	7.7.6
Recovery	Optional	7.7.11
Tunnel Endpoint Identifier Data I	Conditional	7.7.13
Tunnel Endpoint Identifier Signalling	Conditional	7.7.14
Charging ID	Conditional	7.7.16
End user address	Conditional	7.7.17
Protocol Configuration Options	Optional	7.7.21
GGSN Address for signalling	Conditional	GSN Address 7.7.22
GGSN Address for user traffic	Conditional	GSN Address 7.7.22
Charging Gateway Address	Optional	7.7.24
Quality of Service Profile	Conditional	7.7.25
Private Extension	Optional	7.7.26

7.3.3 Update PDP Context Request

An Update PDP Context Request message shall be sent from a SGSN to a GGSN as part of the GPRS Inter SGSN Routeing Update procedure or the PDP Context Modification procedure or to redistribute contexts due to load sharing. It shall be used to change the QoS and the path. The message shall be sent by the new SGSN at the Inter SGSN Routeing Update procedure.

The NSAPI information element together with the Tunnel Endpoint Identifier in the GTP header unambiguously identifies a PDP Context in the GGSN.

The Tunnel Endpoint Identifier Data I field specifies a downlink Tunnel Endpoint Identifier for G-PDUs which is chosen by the SGSN. The GGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent downlink G-PDUs which are related to the requested PDP context.

The Tunnel Endpoint Identifier Signalling field specifies a downlink Tunnel Endpoint Identifier for signalling messages which is chosen by the SGSN. The GGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent downlink signalling messages which are related to the requested PDP context. [This field shall not be present if there already exists a signalling tunnel for the given MS between the peer GSNs.](#)

The Quality of Service Profile information element shall include the QoS negotiated between the MS and SGSN at PDP Context activation or the new QoS negotiated in the PDP Context Modification procedure.

The SGSN shall include an SGSN Address for signalling and an SGSN address for user traffic, which may differ from that provided by the underlying network service (e.g. IP). The GGSN shall store these SGSN Addresses and use them when sending subsequent signalling on this GTP tunnel or G-PDUs to the SGSN for the MS. When active contexts are being

redistributed due to load sharing, G-PDUs that are in transit across the Gn-interface are in an undetermined state and may be lost.

The SGSN shall include a Recovery information element into the Update PDP Context Request if the SGSN is in contact with the GGSN for the very first time or if the SGSN has restarted recently and the new Restart Counter value has not yet been indicated to the GGSN. The GGSN that receives a Recovery information element in the Update PDP Context Request message element shall handle it in the same way as when receiving an Echo Response message. The Update PDP Context Request message shall be considered as a valid update request for the PDP context indicated in the message.

The Traffic Flow Template (TFT) is used to distinguish between different user traffic flows.

The optional Private Extension contains vendor or operator specific information.

Table 6: Information elements in an SGSN-initiated Update PDP Context Request

Information element	Presence requirement	Reference
Recovery	Optional	7.7.11
Tunnel Endpoint Identifier Data I	Mandatory	7.7.13
Tunnel Endpoint Identifier Signalling	Mandatory Conditional	7.7.14
SGSN Address for signalling	Mandatory ConditionalMa andatory	GSN Address 7.7.22
SGSN Address for user traffic	Mandatory	GSN Address 7.7.22
Quality of Service Profile	Mandatory	7.7.25
Private Extension	Optional	7.7.26
TFT	Optional	7.7.28
NSAPI	Mandatory	7.7.30

An Update PDP Context Request may also be sent from a GGSN to a SGSN to re-negotiate the QoS of a PDP context. This GGSN-initiated Update PDP Context Request can also be used to provide a PDP address to the SGSN (and MS). The latter shall be used by GGSN when it acts as a DHCP Relay Agent or Mobil IP Foreign Agent.

The Quality of Service Profile information element shall include the GGSN requested QoS.

The End User Address information element shall contain a valid IPv4 or IPv6 address.

The optional Private Extension contains vendor or operator specific information.

Table 7: Information elements in a GGSN-initiated Update PDP Context Request

Information element	Presence requirement	Reference
End User Address	Optional	7.7.17
Quality of Service Profile	Optional	7.7.25
Private Extension	Optional	7.7.26

*** *Next Change* ***

7.3.4 Update PDP Context Response

The message shall be sent from a GGSN node to a SGSN node as a response of an Update PDP Context Request.

If the SGSN receives an Update PDP Context Response with a Cause value other than 'Request accepted', it shall deactivate the PDP context.

Only the Cause information element and optionally the Recovery information element shall be included in the response if the Cause contains another value than 'Request accepted'.

Possible Cause values are:

- 'Request Accepted'
- 'Non-existent'
- 'Service not supported'
- 'System failure'
- 'Mandatory IE incorrect'
- 'Mandatory IE missing'
- 'Optional IE incorrect'
- 'Invalid message format'
- 'Version not supported'

The Tunnel Endpoint Identifier Data I field specifies an uplink Tunnel Endpoint Identifier for G-PDUs which is chosen by the GGSN. The SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent uplink G-PDUs which are related to the requested PDP context.

The Tunnel Endpoint Identifier Signalling field specifies an uplink Tunnel Endpoint Identifier for signalling messages which is chosen by the GGSN. The SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent uplink signalling messages which are related to the requested PDP context. [This field shall not be present if there already exists a signalling tunnel for the given MS between the peer GSNs.](#)

The QoS values supplied in the Update PDP Context Request may be negotiated downwards by the GGSN. The negotiated values or the original value from SGSN is inserted in the Quality of Service Profile information element. This information element shall be included if the Cause contains the value 'Request accepted'.

If a connection-less path is to be used to tunnel T-PDUs for the given PDP context or a reliable connection-oriented path is to be used and a connection already exists, the GGSN may start to forward T-PDUs after the Update PDP Context Response has been sent and the SGSN may start to forward T-PDUs when the Update PDP Context Response has been received. In this case the SGSN shall also be prepared to receive T-PDUs from the GGSN after it has sent a Update PDP Context Request but before an Update PDP Context Response has been received.

If a reliable connection-oriented path is to be used to tunnel T-PDUs for the given PDP context and a connection does not exist between the GSN pair, the SGSN shall establish a connection and the GGSN shall wait for the connection before forwarding of T-PDUs may start.

Only one connection shall be used between any given GSN-pair, and this connection shall be used to tunnel end user traffic in both directions.

The GGSN shall include a GGSN Address for signalling and an GGSN address for user traffic, which may differ from that provided by the underlying network service (e.g. IP). The SGSN shall store these GGSN Addresses and use them when sending subsequent signalling on this GTP tunnel or G-PDUs to the GGSN for the MS. When active contexts are being redistributed due to load sharing, G-PDUs that are in transit across the Gn -interface are in an undetermined state and may be lost.

The GGSN shall include the Recovery information element into the Update PDP Context Response if the GGSN is in contact with the SGSN for the first time or if the GGSN has restarted recently and the new Restart Counter value has not yet been indicated to the SGSN. The SGSN receiving the Recovery information element shall handle it as when an Echo Response message is received but shall consider the PDP context as updated and active if the response cause indicates a successful operation at the GGSN.

The Charging ID is used to identify all charging records produced in SGSN(s) and the GGSN for this PDP context. The Charging ID has been previously generated by the GGSN and is unique for this PDP context. If an inter-SGSN routing area update occurs, it is transferred to the new SGSN as part of each active PDP context.

The Charging Gateway Address is the IP address of the recommended Charging Gateway Functionality to which the SGSN should transfer the Charging Detail Records (CDR) for this PDP Context.

The optional Private Extension contains vendor or operator specific information.

Table 8: Information elements in an Update PDP Context Response sent by a GGSN

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
Recovery	Optional	7.7.11
Tunnel Endpoint Identifier Data I	Conditional	7.7.13
Tunnel Endpoint Identifier Signalling	Conditional	7.7.14
Charging ID	Conditional	7.7.16
GGSN Address for signalling	Conditional	GSN Address 7.7.22
GGSN Address for user traffic	Conditional	GSN Address 7.7.22
Charging Gateway Address	Optional	7.7.24
Quality of Service Profile	Conditional	7.7.25
Private Extension	Optional	7.7.26

The message can also be sent from a SGSN node to a GGSN node as a response of a GGSN-initiated Update PDP Context Request.

If the GGSN receives an Update PDP Context Response with a Cause value other than 'Request accepted', it shall abort the update of the PDP context.

Only the Cause information element shall be included in the response if the Cause contains another value than 'Request accepted'.

Possible Cause values are the same as for the Update PDP Context Response sent by a GGSN.

The QoS values supplied in the Update PDP Context Request may be negotiated downwards by the SGSN. The negotiated values or the original value from GGSN is inserted in the Quality of Service Profile information element. This information element shall be included if the Cause contains the value 'Request accepted' and a QoS information element was supplied in the corresponding request message.

Table 9: Information elements in an Update PDP Context Response sent by a SGSN

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
Quality of Service Profile	Conditional	7.7.25
Private Extension	Optional	7.7.26

*** *Next Change* ***

7.3.12 PDU Notification Request

When receiving a T-PDU the GGSN checks if a PDP context is established for that PDP address. If no PDP context has been previously established, the GGSN may try to deliver the T-PDU by initiating the Network-Requested PDP Context Activation procedure. The criteria, used by the GGSN to determine whether trying to deliver the T-PDU to the MS or not, may be based on subscription information in the GGSN and are outside the scope of GPRS standardisation.

As part of the Network-Requested PDP Context Activation procedure the GGSN sends a PDU Notification Request message to the SGSN indicated by the HLR, i.e. the current location of the MS. When receiving this message, the SGSN shall be responsible for requesting the MS to activate the indicated PDP Context.

The IMSI is inserted in the IMSI information element in the PDU Notification Request message.

The End User Address information element contains the PDP type and PDP address that the SGSN shall request the MS to activate.

The Access Point Name information element identifies the access point of packet data network that wishes to connect to the MS.

The Tunnel Endpoint Identifier Signalling information element shall be a tunnel endpoint identifier signalling selected by the GGSN and shall be used by the SGSN in the GTP header of the corresponding PDU Notification Response or PDU Notification Request Reject message. [This field shall not be present if there already exists a signalling tunnel for the given MS between the peer GSNs.](#)

If the GGSN receives a Create PDP Context Request before the PDU Notification Response, the GGSN shall handle the Create PDP Context Request as a normal context activation and ignore the following PDU Notification Response.

If the SGSN receives a PDU Notification Request after a Create PDP Context Request has been sent but before a Create PDP Context Response has been received, the SGSN shall only send a PDU Notification Response with Cause 'Request accepted' without any further processing and then wait for the Create PDP Context Response.

The optional Private Extension contains vendor or operator specific information.

Table 17: Information elements in a PDU Notification Request

Information element	Presence requirement	Reference
IMSI	Mandatory	7.7.2
Tunnel Endpoint Identifier Signalling	MandatoryConditional	7.7.14
End User Address	Mandatory	7.7.17
Access Point Name	Mandatory	7.7.20
Private Extension	Optional	7.7.26

*** *Next Change* ***

7.5.7 Forward Relocation Response

The new SGSN shall send a Forward Relocation Response to the old SGSN as a response to a previous Forward Relocation Request.

Possible Cause values is:

- 'Request Accepted'
- 'System failure'
- 'Mandatory IE incorrect'
- 'Mandatory IE missing'
- 'Optional IE incorrect'
- 'No resources available'
- 'Invalid message format'
- 'Version not supported'.

The Cause and RANAP Cause information element shall be included in the response if the Cause contains another value than 'Request accepted'.

All information elements are mandatory, except Private Extension, if the Cause contains the value 'Request accepted'.

RANAP Cause is mandatory if cause value contains in RANAP message.

[TransparentTransparent](#) container and RANAP Cause are informed from the target RNC in the new SGSN.

Single number or ~~plural~~ plural number of Target RNC Information parameter shall be set in this message.

The Tunnel Endpoint Identifier Signalling field specifies a Tunnel Endpoint Identifier that is chosen by the new SGSN. The old SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent signalling messages that are sent from the old SGSN to the new SGSN.

The optional Private Extension contains vendor or operator specific information.

Table 33: Information elements in a Forward Relocation Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
Private Extension	Optional	7.7.26
UTRAN transparent container	Optional	7.7.32
RANAP Cause	Conditional	7.7.33
Target RNC Information	Conditional	7.7.34
<u>Tunnel Endpoint Identifier Signalling</u>	<u>Conditional</u>	<u>7.7.xx</u>

*** *Next Change* ***

8.2 Usage of the GTP-C Header

For signalling messages the GTP header shall be used as follows:

- Version shall be set to decimal 1 ('001').
- Payload Type (PT) shall be set to '0'.
- (S) shall be set to '0'.
- SNN shall be set to '0'.- Message Type shall be set to the unique value that is used for each type of signalling message. Valid message types are marked with a x in the GTP-C column in Table 1.
- Length shall be the length, in octets, of the signalling message excluding the GTP header.
- The Tunnel Endpoint Identifier is set by the sending entity to the value requested value by the corresponding entity (SGSN or GGSN) and points out the mobility management context (e.g. the MS and its associated context data), except for the following cases:
 - The first Create PDP Context Request message for a given MS sent to a specific GGSN shall have the Tunnel Endpoint Identifier set to all zeros, since this will be the message that establishes the tunnel in the signalling plane for this specific MS. One exception is the Network Initiated PDP context activation procedure, where the TEID in the Create PDP Context Request shall be set to the TEID requested in the PDU Notification Request.
 - The Identification Request/Response messages where the Tunnel Endpoint Identifier shall be set to all zeros.
 - The SGSN Context Request message where the Tunnel Endpoint Identifier shall be set to all zeros.
 - The Echo Request/Response and Version Not Supported messages where the Tunnel Endpoint Identifier shall be set to all zeros.
 - The Forward Relocation Request message where the Tunnel Endpoint Identifier shall be set to all zeros.
 - The PDU Notification Request message where the Tunnel Endpoint Identifier shall be set to all zeros, except for the case where a signalling tunnel is already established for that specific MS.
 - All Location Management messages where the Tunnel Endpoint Identifier shall be set to all zeros.
- Sequence Number shall be a message number valid for a path or a tunnel. Within a given set of contiguous Sequence Numbers from 0 to 65535, a given Sequence Number shall, if used, unambiguously define a GTP signalling request message sent on the path or tunnel (see section Reliable delivery of signalling messages). The Sequence Number in a signalling response message shall be copied from the signalling request message that the GSN is replying to.
- SNDCP N-PDU Number shall not be present.

The GTP header may be followed by subsequent information elements dependent on the type of signalling message. Only one information element of each type is allowed in a single signalling message, except for the Authentication Triplet, the PDP Context and the Tunnel Endpoint Identifier Data II information element where several occurrences of each type are allowed.

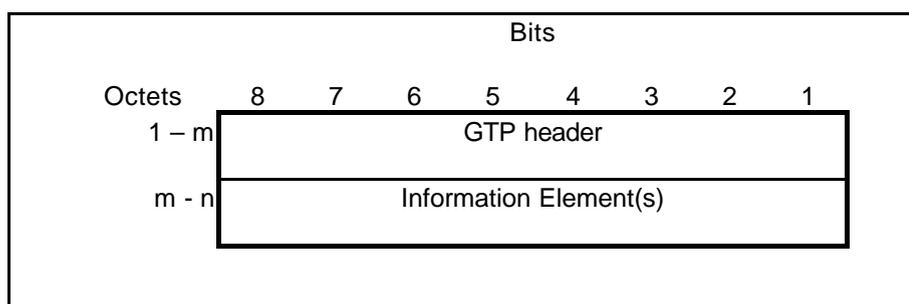


Figure 50: GTP header followed by subsequent Information Elements

*** *Next Change* ***

9.3.1 Usage of the GTP-U Header

The GTP-U header shall be used as follows:

- Version shall be set to decimal 1 ('001').
- Payload Type (PT) shall be set to '0'.
- If the S field is set to '1' the sequence number field is present otherwise it is set to '0'.
- SNN flag: The GTP-U header includes the optional SNDCP N-PDU Number field if the SNN flag is set to 1.
- Message Type shall be set according to Table 1. The value 255 is used when T-PDUs are transmitted. The value 1 and 2 are used for "Echo" messages. The value 3 for "Version Non Supported" messages.
- Length: Size of the T-PDU excluding the GTP-U header size.
- Sequence Number: This field is present only if the S field is set to 1. The handling of this field is specified in section 9.1.1. It shall be used in order to decide whether or not to discard a received T-PDU, as specified in sub-clause 9.3.1.1 Usage of the Sequence Number.
- SNDCP N-PDU Number: This field shall be included if and only if the SNN flag is set to 1. In this case, it is used by the old SGSN (or RNC), at the Inter SGSN Routeing Area Update procedure (or SRNS relocation), to inform the new SGSN (or RNC) of the N-PDU number assigned to T-PDU. If an N-PDU number was not assigned to the T-PDU by SNDCP, or if the T-PDU is to be transferred using unacknowledged peer-to-peer LLC operation, then SNN shall be set to 0.
- TEID: Contains the tunnel [endpoint](#) identifier for the tunnel to which this T-PDU belongs. The TEID shall be used by the receiving [entity](#) to find the ~~MM and~~ PDP context ~~s~~.